

NEWSLETTER

GEOLOGICAL SOCIETY
OF
NEW ZEALAND



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GEOLOGICAL SOCIETY OF NEW ZEALAND

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SOME THOUGHTS ON THE INTERNATIONAL SCENE IN GEOLOGY

by J. Healy

The International Geophysical Year, born in the minds of a few American geophysicists at an informal house gathering in much the same way that the Geological Map of New Zealand project was started some years ago, has now made history in the annals of international science. It was not so much what has been achieved by this venture as the way in which it was taken up by nations around the world and showed how co-operation in the field of science could take place. Certainly it has started something in this field which is changing the course of science. As far as geology is concerned, one of the immediate effects was a rejuvenation of the International Union of Geodesy and Geophysics (IUGG) and of the constituent associations of which it is composed. More recently the International Hydrological Decade and the Upper Mantle Project have started further wide-scale fields of co-operation on a more continuing basis. The very instigation of these has shown up the need for a greater co-operation in the remaining fields of geology with the result that the International Union of Geological Sciences (IUGS) has been formed and the Geological Society of New Zealand, as a constituent member of the Royal Society of New Zealand, can be regarded as affiliated with it.

There are conflicting views on the aims and results of many of these international projects. It is all too easy to set up organizations merely for the purpose of organizing, and interested groups can use these for the furtherance of their own aims in the field of empire building. So far the impact on New Zealand has not been strong in the geological field but it is certain that this influence will increase steadily in the future.

There is still some lack of cohesion on an international basis. For example the organization and the partial financing of the international scientific organizations is carried out by UNESCO whereas other branches of the United Nations, such as Technical Assistance and Special Fund, operate on occasions with the assistance of experts without knowledge of the existence of some international organizations and the assistance that they could give. However, New Zealand is gradually acquiring some interest in, and a part in, these activities. Dr H. W. Wellman of Victoria University, Wellington, was appointed by the International Union of Geological Sciences, on the recommendations of the Committee for Geology of the Royal Society of New Zealand, to an international group to make special seismic and seismo-tectonic studies on an international basis. The contributions made already by New Zealand scientists in this field are no doubt responsible for the request that New Zealand should nominate somebody for this group.

The Upper Mantle Project, the scope of which is not yet fully appreciated by many, has had little affect on the planning of future studies of New Zealand. Our programme is based on existing work already in hand rather than on new work planned as part of the project. As this proceeds and the results of studies generally become wider known it will become increasingly obvious that geology has a large part to play in this project.

The changes in the International scene are already being reflected in a proposed re-organization of the International Union of Geodesy and Geophysics, composed of a number of International Associations each of which is only broadly disciplinary and involves the co-operation of scientists from various branches of geology, geophysics and geochemistry. The Union has become somewhat top-heavy and there is a move to re-organize it so that the scientists involved will be grouped in new ways which will cut across the boundaries of the older Associations. These proposals have to some extent come out of the organization for the Upper Mantle Project but they are also conditioned by the sheer bulk of the Union in toto and all the difficulties of holding General Assembly meetings at which all Associations attend. It seems that there is no ideal method of splitting up the various branches of geology and geophysics concerned, and the important thing appears to be to retain some elasticity so that the inter-relationship of the various branches is maintained. For example, if seismologists are organized into one group, provision should be made for them to come into contact with geologists and geochemists working on specific problems associated with seismology, for example on volcanology. On the other hand, if the Associations are retained then provision should be made for the seismologists to meet with other seismologists.

Geologists in New Zealand, as elsewhere, have always been interested in the geology of other countries. This is promoted by exchange of literature, by private correspondence, and by attendance at International meetings. However, the tendency for the science to be organized on a world basis with local Liaison Committees, means that there is a better chance for the pooling of ideas and for the establishment of certain lines of research which may be critically aimed at solving specific problems. This is something in which New Zealand, through its own National Committee and its membership with the International Union of Geological Sciences, will be required to play its part. Geologists in New Zealand are few in number but they still have their part to play on the international scale and it is likely that this part will become of increasing importance, especially in the organization of geology within the country, because in contributing we will gain more than we give.

REPRINTS OF TRANSACTIONS - ROYAL SOCIETY OF N. Z.
AND N. Z. INSTITUTE

The Council of the Royal Society of N. Z. has decided to sell its stocks of reprints of papers published in its Transactions. Lists of reprints available, some dating back to the 1870's, have been distributed to Member Bodies, and these give prices and numbers to be used in ordering. Members of the Geological Society can see these lists, which include 490 geological papers, on application to Committee Members of the Society or to the Secretary of their local branch of the Royal Society.

NEW ZEALAND GEOLOGICAL SURVEY CENTENARY 1865 - 1965

In August it will be 100 years since James Hector took up his appointment in Wellington as the Director of the New Zealand Geological Survey. As one of the oldest geological surveys in the Commonwealth (next to Great Britain, Canada and India) the N. Z. G. S. is proud to celebrate the end of its first hundred years and to point to the achievements of New Zealand geologists during a century. The Dominion Museum and the Chemistry Division of the Department of Scientific and Industrial Research, both of which had their inception under Hector as the Colonial Museum and Dominion Analyst, also celebrate their centenary in 1965.

This year is a busy one, with a succession of conferences beginning with the Earthquake Engineering Conference in January followed by the Eleventh Royal Society Science Congress in February, and the Eighth Commonwealth Mining and Metallurgical Congress in April.

In connection with the Eighth Commonwealth Mining and Metallurgical Congress, a volume entitled "Economic Geology of New Zealand" has been prepared under the editorship of Prof. G. T. Williams of the University of Otago. This volume will in effect represent an assessment, based on published and unpublished material, of the economic geology carried on over the last 100 years in New Zealand. Several members of the Survey have made contributions. Its publication in the Survey's 100th year is a happy coincidence.

The Government is giving support to the International Volcanological Congress in November and December to mark the Survey's centennial year.

The Geological Survey annual conference will be held in the first week of August in Wellington and during that week it is proposed to hold a dinner for present and past members of the Survey. Papers presented at the Conference will be published in the special Centennial Number of the N. Z. Journal of Geology and Geophysics later in the year.

A short history of the Survey is being prepared for publication during 1965 and a number of geological exhibits are planned for several open days at Headquarters in Lower Hutt in July. It is intended that these exhibits will be displayed in the Dominion Museum for the remainder of the year. It is also hoped that several distinguished overseas geologists will be able to visit New Zealand and give addresses during the year.

Early hopes that the centenary of government science in New Zealand would be celebrated by the issue of a postage stamp were disappointed when requests by the Royal Society and by D. S. & I. R. for a centenary stamp were declined by the Postmaster-General. Nevertheless, most geologists being map collectors rather than stamp collectors will find consolation in knowing that publication of the N. Z. G. S. 1:250,000 series will be almost completed in 1965. Maps likely to be published during this year are: East Cape, Gisborne, Taranaki, Hokitika,

Haast, Mt Cook, Invercargill, Stewart Island, and possibly Wellington and Dunedin, but the Auckland sheet is not expected to be published until 1966.

Although it is not likely to be published during 1965, "The Geology of New Zealand" and a new 1:1,000,000 geological map will in 1966 make a fitting summary of one hundred years of geological work in New Zealand.

Mr N. de B. Hornibrook is in charge of the Centenary arrangements and Mrs Peggy Burton is working on the history of the Survey.

- R. W. W.

A MORAL ALPHABET

D

The Dreadful Dinotherium he
Will have to do his best for D,
The early world observed with awe
His back, indented like a saw,
His look was gay, his voice was strong;
His tail was neither short nor long;
His trunk, or elongated nose,
Was not so large as some suppose;
His teeth, as all the world allows,
Were graminivorous, like a cow's.
He therefore should have wished to pass
Long peaceful nights upon the Grass,
But being mad the brute preferred
To roost in branches, like a bird.¹
A creature heavier than a whale,
You see at once, could hardly fail
To suffer badly when he slid
And tumbled (as he always did).
His fossil, therefore, comes to light
All broken up: and serve him right.

Moral

If you were born to walk the ground,
Remain there; do not fool around.

HILAIRE BELLOC

¹ We have good reason to suppose
He did so, from his claw-like toes.

SOME GEOLOGICAL SURVEYS OF SOUTH AND SOUTH-EAST ASIA

by J. B. Waterhouse

During a visit to Thailand, India and Pakistan in the course of attending the 1964 International Geological Congress, I paid particular attention to the structure and aspirations of the various Geological Surveys and to the kind of aid given to these surveys by other countries. These notes summarise my impressions of the Geological Surveys of these three countries and suggest further means of co-operating with them in their scientific development. Comments are confined mainly to the palaeontological situation, as an illustration of a widespread lack of specialists.

THAILAND

The Geological Survey of Thailand is part of the Department of Mines, together with sister sections - economic and water supply. At the head of the department are 3 geologists, the Director-General, Mr Vija Sethaput, the Deputy Director, Mr Saman Buravas, and the Senior Principle Geologist, Mr Junichet C. Javanaphet, all concerned now with administration. Chief of the Geological Survey is Mr Kaset Pitakpaivan. The entire organisation has just undergone considerable replanning and expansion, with the help of a major part of Thailand's budget to be spent on scientific and economic development. A large new wing has been just completed for the Economic Section at Bangkok, where the departments are grouped together in a manner apparently too sensible to have been achieved by our own government and department. The Geological Survey are building a very large district office in Chiangmai and another in Khonkhaen, partly for security reasons. A third is planned for either Songkhla or Singora in the south. These district offices will be bases for a priority project of mapping the geology at 1:250,000. A start was made last year and the first real effort begins in November 1964, one area near Loci, the other north of Chiangmai. Field geologists are well treated - houses are rented in key areas for their accommodation and an allowance of 20 Baht paid a day. Men to nose out and collect fossils and carry rocks are hired at 15 Baht a day, nominally 5/-, but the usual labourers rate is 10 Baht a day. The present Geological Survey staff comprises 14 field geologists, with 2 to come next year and 2 more under training in New Zealand, and 6 more to come in 1966; 1 palaeontologist (trained on forams) and another training in Japan (again on forams); 1 photo geologist and 1 in training, and 1 igneous petrologist. I find these proportions alarmingly bad, for in New Zealand where similar emphasis is placed on mapping we find it necessary to support every two field geologists with one palaeontologist and one petrologist. By contrast, the Thai proportions will soon be about 10 field geologists to 1 palaeontologist and 20 field geologists to 1 petrologist.

INDIA

The Indian Geological Survey is a large institution with over 600 geologists at Calcutta alone. In recent years they have concentrated on economic work but are now realising that the best method of finding minerals and dam-sites is to map the entire country geologically. Under the economic drive palaeontology suffered an eclipse but the need for palaeontologists to assist with correlating strata is becoming widely appreciated and the specialist staff is now being built up. One of the most important problems facing the Geological Survey of India is the paucity of top-line specialists in palaeontology able to conduct research, or train younger men.

PAKISTAN

The Pakistan Geological Survey was built up under its recently retired Director-General Khan to a strength of 60 geologists. The old policy of concentrating solely on mineral resources has been found fruitless and it is proposed to adopt regional mapping as the most useful method of understanding and developing the country geologically and economically. Once again we find a grave shortage of specialists, especially palaeontologists. Only 3 are on the staff, one a young man to be trained in palynology.

SCIENTIFIC CO-OPERATION

As far as geology is concerned, the chief form of scientific aid given by New Zealand to countries of South-east Asia under the Colombo Plan is the training of young people in New Zealand. These people then return to their country with the benefit of additional experience and contribute much to geological exploration in their home land. It must be pointed out that there are two disadvantages in this form of aid. Firstly, the foreign student is trained to cope with New Zealand rather than local problems and on his return home he must adapt himself to new conditions. Secondly, the people who visit us are young, with little or no "field experience" - often they have come straight from a university and this means that they waste a certain amount of time here learning a basic approach which could equally well be learnt in their home country.

A second form of aid which New Zealand has contributed on a very small scale is the loan of her own highly trained geologists to another country for a short time. Other countries, such as the United States, Britain, Germany, France, etc., have 'overseas branches' to their geological surveys and keep their men in the field for 2 to 3 years as a form of aid to the Asian countries. Such experts are assigned a wide variety of projects, from mineral exploration to geological mapping. The expenses for the geologists are met by the home country. But although the geologists concerned do a fine job they do not always contribute much in the long run to the development of geological understanding of the host country. Their achievements differ little from those by visiting scientists, often from universities, who have come to pick out some particular

"plum" of research and add to their own name and lustre. Many of the university and aid-giving geologists prefer to work on their own and do not train the local geologists in new techniques. In some cases considerable ill-feeling has been generated because of the lack of co-operation between local and visiting geologists. Such projects are cynically viewed by the local geologists as a form of colonialism for waving the flag and for filling the pockets of the supposedly help-giving foreign geologists. The local attitude may be unfair, but that is what it is.

There is room for a new form of aid which should avoid most of the dangers incurred by the other two methods. What is needed is "personal teaching co-operation" in which highly skilled geologists can train one or two or three foreign geologists in the techniques of solving a problem. That is, a project of importance to the overseas country should be tackled jointly by an experienced New Zealander and a geologist from the overseas country. As the project is worked out, the foreign geologist will become skilled in techniques and, after the project is completed, should be able to tackle similar problems on his own. An excellent form of aid project that New Zealand could give would be to lend a palaeontologist to work with one of the Asian palaeontologists on an Asian problem. The two could work on a fauna of fossils together for 6 - 12 months and publish the results jointly. By the time the project had been completed, the Asian would be fully competent to go on and work on other similar fossils on his own. Once a few men had been so trained, a pool of Asian specialists would be formed, able to cope with their own geological projects, and indeed able to teach other Asians so that the programme should not last indefinitely, but should encourage independence. It would be possible to carry out this form of aid either by shifting the Asian geologist and his fossils to New Zealand, or by sending the New Zealand geologist (and his library) to Asia.

That there is need for palaeontologists is unquestionable - the renewed field mapping can hardly progress without it. The two chief fields are micro-palaeontology, especially spores, pollens, conodonts, etc., in which almost no work has been done outside India, and in upper Paleozoic faunas. (Mesozoic is of less importance, and Tertiary of negligible value.) Several geologists have toyed with the fossils but lack the experience to finalise their work. In talking with them, they have told me how much they would appreciate training in the form I have outlined.

In summary, I am sure that New Zealand could initiate joint research projects of genuine value and of a form that would be widely appreciated.

NOTES ON THE GEOLOGICAL SURVEY OF MALAYSIA

by R. W. Willett

The Geological Survey of Malaysia is at present in three distinct units: those of Malaya, Sarawak and Sabah. These represent the original geological surveys of Malaya, Sarawak and North Borneo respectively and, although the territories mentioned are now grouped politically as Malaysian, Federal intergration as it affects State organisations, particularly the geological survey has not yet proceeded to any effective level.

The major Survey of the three mentioned is that of Malaya whose headquarters are located in a handsome new air-conditioned building at Ipoh. Here, the Director (Dr Alexander) together with administrative staff, field geologists, specialists and cartographic unit, are located. The Survey is also served by several district offices around Malaya which are no more than field headquarters where an officer deals with local problems and has the responsibility of the geological mapping of adjacent sheets. The headquarters is extremely well equipped, particularly in the petrological and mineralogical laboratory, but in spite of this high level of instrumentation it lacks trained staff to make use of it. Many of its petrological and mineralogical instruments have been the gift of various aid organisations, particularly those of the United Kingdom Government. A mapping programme of 1:100,000 is being pursued but not as actively as it is in the other branches of the Survey in Borneo; nor is publication as active as perhaps it should be. In fact one of the problems facing the Survey at Ipoh is the difficulty of getting publications through the government printer, who is under tremendous pressure from other departments for his services - as would be expected in a developing country.

The Malayan Survey is responsible for the geology of the country and its application, where it is of course particularly associated with the mining fields, and has recently entered the field of engineering geology. Malaya is dominantly a country of hard rock geology, and palaeontology hardly enters the picture; what palaeontological work is needed for the small occurrences of Permian rocks is carried out by overseas specialists. In a developing country where the Ministers are closely involved and interested in State services associated with its growth, the Director of necessity spends much time at Kuala Lumpur, the capital, on committees and in discussion with various Ministers.

In Sarawak the Survey, in charge of Dr Wilson (a Deputy Director), located at Kuching is nowhere near as specialised or well equipped as that of Ipoh. Nevertheless, it has a very fine record of field work and publication. Here are found the normal services associated with a small geological survey,

including chemical and petrology laboratories, together with a very fine library. This Survey has completed 1:100,000 maps of Sarawak and Sabah; each map being accompanied by an explanatory memoir; a very fine achievement indeed, offering a first class foundation for future detailed work.

At Jesselton in Sabah is the smallest section of the Malaysian Survey, now actively engaged in mineral development as a result of this 1:100,000 mapping. It is a normal type of field office but one of their active specialities is geochemical prospecting in which they have been closely associated with the Labuk Valley project. The present Assistant Director in charge of Sabah is Dr Collinette.

The surveys throughout Malaysia are, of course, increasing their staff by the addition of trained Malaysian geologists who have, for the most part, spent sometime overseas in Canada or Great Britain. Not as many professional officers are coming forward from the Malaysian community as, perhaps, is wished, but the technical field is certainly being well supported by able and enthusiastic local men. Already in New Zealand we have had several technicians from the surveys of Malaysia for training and who have proved themselves to be able and quick to learn and to apply; it was pleasing to meet these men in their own surveys where they now hold quite responsible positions. Stephen Mojingol is in charge of the petrological technicians at Jesselton and Mr Joseph Goh is now librarian at Kuching where he has an excellently arranged and workable library. Both the Borneo surveys obtain specialist advice and forward any material that is beyond their laboratory capabilities to either Ipoh or to the overseas geological survey in London. Their micro-palaeontology is, however, done by the Shell group operating in Brunei, the independent state lying between Sarawak and Sabah. Here, incidentally, Dr R. A. Couper, formerly of the N. Z. Geological Survey, is now chief stratigrapher. From the point of view of geology the country is one of difficult field work but does possess extremely interesting problems. The exposures are rare and, of course, the search for them is confined to creeks and rivers. However, an increasing number of roads are being put through Malaysia at various points giving a greater number of exposures and increased access - all of which is benefiting geology considerably. The country is well covered by air photo graphy, although the cloud problem in tropical country such as this is one not easy to overcome. Geology can do much for Malaysia, and New Zealand can, I think, do much to help in training both professional officers and technicians. I look forward to a continual flow of Malayan geologists to New Zealand, for I think we have much to give them, especially as the size of activities in their country is comparable with that of our own.

REPORT ON SECTION D OF THE 11TH NEW ZEALAND SCIENCE CONGRESS
AUCKLAND

More than any previous New Zealand Science Congress, the 11th Congress set out to bring individual sciences to the layman and to the scientists in other disciplines. To effect this, the number of sections was reduced to 8, with the result that geology was included with pedology, oceanography and geophysics in the Earth Sciences Section D. Another innovation, resulting from the aims of the Congress, was the inviting of papers on specific subjects. The programme consisted of morning Section Symposia and afternoon General Symposia, to which the public were, in particular, invited.

Section D was responsible for the organising and running of two General Symposia. On the afternoon of the opening day, Dr P. Siple chaired a symposium on "Antarctic Research" which was fittingly opened by a talk on "The Mapping of Antarctica" by Mr J. Holmes Miller. Dr B. Stonehouse discussed "Animal Conservation in Antarctica", and was followed by Professor A. T. Wilson, whose controversial "World Climate Control by Antarctic Processes" generated a rather heated discussion.

On the final afternoon of the Congress, Mr R. W. Willett chaired a symposium on the "Exploitation of Mineral Resources", in which Dr D. Kear began with "A Scientific New Look for New Zealand's Mineral Resources"; Mr M. H. Buckenham stressed the very necessary "Mineral Utilization Studies in a Mineral Resources Development Programme" and Mr N. R. Davis emphasised "Economic Aspects of the Exploitation of Mineral Resources in New Zealand."

The first of Section D's own symposia concerned the physical environment of the Auckland District. Dr P. F. Ballance's "The Physiography of the Auckland District" was followed by Mr J. C. Schofield's "Geology of Auckland Region", and Mr I. J. Pohlen's "Soils of the Auckland District". Mr P. H. Barker contributed "The Auckland District Oceanography", and Mr G. A. Eiby's "Earthquakes in the Auckland Province" led to considerable discussion.

This symposium formed a background to the weekend Congress Excursions which included visits to Rangitoto and Motutapu Islands, the volcanoes of the Auckland and Pukekohe-Bombay areas, and the Papakura-Drury-Maramarua-Meremere areas. Unfortunately the opening of the Congress coincided with the arrival of a tropical storm so that attendances were below expectation, particularly on Saturday.

Despite the fact that there had been an earlier General Symposium on "Science in Education", Dr Maxwell Gage's Chairman's Address "Education in Geology" was well attended, as was the following "Education in Earth Sciences"

panel. The panel consisted of Dr E. I. Robertson, Professor R. H. Clark, Mr B. W. Collins, Mr D. Hunkin and Mr G. Thorp, and resulted in a spirited discussion in which the number of well formulated and well delivered contribution from the floor reflected the presence of not a few members of the teaching profession.

In the symposium on "Oceanic Environment", chaired by Dr A. W. B. Powell, Mr I. N. Estcourt described aspects of "Animal Preference for Sediments of Different Grades". Dr W. J. M. van der Linden's "Shelf Sediments" was followed by Dr A. C. Kibblewhite's "A long-Range Sound Transmission Experiment in the Deep Ocean", which culminated in a tape recording of an oceanic volcano grumbling.

Geophysical contributions concerned with "The Nature of the Crust" were chaired by Dr R. P. Suggate. "The Earth's Crust in New Zealand: Gravity Evidence" was discussed by Mr W. I. Reilly, and the "Pacific Island Crustal Structure" by Dr E. I. Robertson. "The Magnetic Evidence Concerning the Nature of the Earth's Crust" was described by Dr T. Hatherton.

A joint symposium with Section C (Biological Sciences) considered "Aspects of Evolution in the New Zealand Pleistocene" under the Chairmanship of Dr C. A. Fleming, who introduced the session with an address on "Evolution During the Pleistocene". Geological aspects were considered by Dr R. P. Suggate in "The Physical Setting of the South Island in the Pleistocene", and by Mr T. L. Grant-Taylor in "The Physical Setting of the South Island in the Pleistocene", and by Mr T. L. Grant-Taylor in the "The Physical Setting of the North Island in the Pleistocene". In the second half of this session, Dr C. J. Burrows discussed "Evolution Times for New Zealand Plants in the Quaternary"; Dr R. S. Bigelow described "Pleistocene Evolution of New Zealand Grasshoppers" and Dr P. M. Johns the "Speciation and Variation in some Millipedes and Beetles in Relation to Pleistocene and Holocene Events". Concurrently with this part of the session, Mr J. D. McCraw chaired a symposium on "Soils and Landscape", in which Mr N. Wells described the "Stages of Soil Development"; Mr H. S. Gibbs discussed the evolution of "Soil Landscapes of New Zealand", and Mr J. G. Bruce demonstrated the "Soil-Landscape Association in Raglan County".

About 100 members of the Congress expressed primary interest in the activities of Section D and, although the afternoon symposia attracted greater numbers, the morning symposia attendances varied from 40 to about 90. These figures appear to be lower than those for the more recent preceding congresses. They may have been influenced by the changes in organisation of the congress but probably the most important factor was the large number of other conferences of interest to earth scientists during the years 1964-65.

ANZ A A S

GEOLOGY (SECTION C) MEETING, HOBART, AUGUST 1965

The practice of holding a number of symposia at ANZAAS Section C meetings is to be continued. The following topics have been suggested as suitable:

1. Earth movements in Australia and their precise date.
2. Geology of Bass Strait.
3. Mesoscopic folds and associated structures.
4. Lower Palaeozoic palaeogeography of Australasia.
5. Correlation of the Australasian Tertiary.
6. Geology of New Guinea.

Suggestions have also been received for symposia in the following fields:

1. Recent sedimentation.
2. Slope stability and landslides.
3. Geophysical exploration and the siting of dams.
4. Seismology.
5. Iron ore deposits.
6. Meteorites and tectites.
7. Vulcanism and ore deposits.
8. Glaciation and glacial deposits.
9. Groundwater.

In order that a final list of suitable topics be made in the near future we invite all those interested to send suggestions and indicate if they may have contributions for the meeting.

Please write to:

Dr E. Williams,
Secretary, Section C,
ANZAAS,
C/- Department of Mines,
Box 124B, G. P. O.,
HOBART, Tasmania.

NOTES FROM THE GEOLOGY DEPARTMENT - UNIVERSITY OF OTAGO

Mr Peter B. Read arrived in February to take up his position as Lecturer. A Canadian, he did his undergraduate work and Master's degree at the University of British Columbia. After graduation he worked for a year with a mining company in British Columbia. He came to New Zealand from Berkeley where he has spent three years working on the structural problems of an area of Palaeozoic and Mesozoic rocks in southeastern British Columbia. He is especially interested in the study of superposed deformations.

Mr R. M. Carter, Assistant Lecturer, is on leave, having taken up a Commonwealth Fellowship at the Sedgwick Museum, Cambridge. Mr A. E. Grady has been appointed Assistant Lecturer.

Mr B. R. Paterson has joined the staff as Curator and is responsible for the care and curating of all departmental collections.

During the latter half of 1964 a series of research discussions were held in the Department. These were attended by members of the department, the Geological Survey, and others.

The titles and speakers were as follows:

Glaciological Theory applied to late Pleistocene glaciers of the South Island and Flat-topped Volcanoes (two lectures), by Prof. W. H. Matthews.

Pitcairn Island, by R. M. Carter.

Coastal processes around Otago Peninsula, by W. A. Hodgson.

Tectonic unrest in the Central Rockies, by C. A. Landis.

Auckland Islands, by J. B. Wright.

The economic geology of the rocks of northwest Otago and south Westland, by A. R. Mutch

Potassium selectivity of synthetic zeolite membranes, by A. E. Meder.

Greywackes and schist: a genetic relationship, by A. E. Grady.

Petrography and structure of the greywackes in the Benmore Dam area, by Y. K. Shu.

Kaihikuan rocks at Corbies Creek, North Otago, by R. J. Ryburn.

Mr C. A. Landis, formerly of Pennsylvania State University, is in the Department as research fellow supported by a National Science Foundation Grant. He is engaged in a mineralogical and structural study of upper Permian rocks of the South Island. Mr J. S. Dickey Jr., from Dartmouth College, New Hampshire, who holds Fulbright award, is working on the petrology of the Kakanui Mineral Breccia.

Mr P. C. Rickwood from the University of Bristol, Commonwealth Fellow, is studying garnets of the Timaru Basalt and of Fiordland gneisses. Mrs Jocelyn K. Campbell is mapping the Akatore coastal block with a view to unravelling its structure. Mr R. J. Ryburn is mapping an area near Otematata including Corbies Creek, and Messrs J. M. Barry and R. J. Cavaney are completing masters theses in the Upper Shotover and Green Valleys respectively. Mr K. H. Khoo is undertaking a mineragraphic study of manganese ore bodies of East Otago.

Recent visitors to the Department include Professor W. H. Matthews, University of British Columbia; Professor Marland P. Billings, Harvard University; Professor W. R. Dickinson, Stanford University; Professor D. de Warrd, Syracuse University and Professor P. K. Sutherland, Oklahoma University.

Several years ago a four-year B.Sc. Honours degree was introduced at Otago. A four subject intermediate year is followed by three years of work in the major field of study with two courses (not necessarily units as such) in ancillary or related subjects. In comparison with the ordinary B.Sc. degree there is more time for a comprehensive treatment of the subject at second and third year levels and consequently a better foundation is laid on which to build advanced specialized courses in the fourth year. A research project is carried out in the fourth year; it is somewhat smaller in scope than the old M.Sc. thesis and, in geology, normally involves the mapping of an area; results are presented in the form of a report. The reports are held in the Geology Department.

Graduates with B.Sc. Hons. may proceed to M.Sc. in their fifth year by submitting a thesis only; those with first or second class honours may embark on a Ph.D.

So far six students have graduated B.Sc. Hons. in Geology and have presented the following project reports:

- C. T. Harper - Geology of a section through the Central Takitimu Mountains.
- R. M. Carter - Geology of the Komako, Pohangina County.
- L. R. Dodds - Geology of Fairfield.
- A. E. Meder - Some aspects of the geology of the Mossburn District, Southland, New Zealand.
- R. J. Ryburn - A strip of Kaihikuan sediments between the Otematata and Otamatapaio Rivers, North Otago.
- Shu Yeoh Khoo - Greywacke structure and petrography around Benmore Dam, North Otago.

The floor space of the Department is to be substantially augmented late in 1965 by acquisition of laboratory and research rooms in an interim building now being constructed south of the Home Science School.

SUMMARY AND REVIEW

"Economic Geology of New Zealand" by G. J. Williams et al. Vol. 4 of special publications associated with the Eighth Commonwealth Mining and Metallurgical Congress held in Australia and New Zealand, March-April 1965.

This volume is a very comprehensive account of New Zealand's economic geology from pre-pakeha time until the present. It is edited and largely written by Professor G. J. Williams of the University of Otago, who accomplished the task in the incredibly short time of 15 months. This rush is not reflected in the volume, which attains a high standard in every respect. It contains 400 pages and about 200 illustrations, diagrams and maps, some of the latter being in three colours and several tone patterns.

The volume commences with a brief outline of the geology of New Zealand and the mineralization associated with each geological period. This is followed by an historical and production summary of the mineral industry written by the Chief Inspector of Mines, Mr L. S. Jones. The remaining 370 pages are devoted to descriptions of mineral deposits; the layout generally commences with an outline of the regional and local geology, which is followed by detailed descriptions of actual deposits, old workings, ore grades and some production figures, and concludes with a genetic discussion. A comprehensive bibliography is included at the end of each chapter.

Chapters 3 to 8 inclusive deal with gold. The first three of these chapters deal with gold in Precambrian, early Palaeozoic and Carboniferous-Permian rocks respectively, the latter group being considered as rocks of the New Zealand geosyncline. These are followed by a chapter on the genesis of gold and associated minerals, such as scheelite and base metal sulphides, in these pre-Tertiary environments. A metamorphic origin is favoured in preference to the classical idea of hot solutions derived from granite. Chapters 7 and 8 complete the story of gold by describing detrital gold and the Tertiary epithermal gold-silver-base metal sulphide deposits of the Coromandel-Waihi field.

The next chapter deals with iron and titanium-bearing minerals and includes solid deposits such as the Onekaka iron ores as well as the vast beach-sand deposits.

Chapter 10 describes the ultramafic rocks, their associated chromium, copper, nickel, cobalt, scandium, and platinoid minerals, and deposits of non-metallics such as nephrite, talc, magnesite and asbestos.

This is followed by a short and thought-provoking chapter on possible links between alkalic rocks and mineralization. Metals such as gold, silver, bismuth, uranium, tantalum, niobium, and titanium are quoted as examples.

Chapter 12 discusses copper deposits in their various metallogenetic epochs. Gold, silver, lead, zinc, molybdenum, and nickel, are associated with copper in some of the deposits described.

There follows a lengthy chapter entitled 'various metalliferous occurrences' which describes occurrences of minerals containing antimony, barium, beryllium, bismuth, manganese, mercury, molybdenum, silver, tin, tungsten, uranium, zirconium, and rare earths (notably monazite).

The introduction and description of metallic deposits takes up about half of the volume.

Chapter 14 describes minor non-metallic igneous, metamorphic and metasomatic minerals, viz., alunite, apatite, feldspar, fluorite, garnet, graphite, gypsum, mica, perlite, spinels, sulphur, wollastonite, and zeolites.

The next chapter, written jointly by G. W. Grindley and G. J. Williams, covers geothermal waters, and it will probably become a standard reference for the subject. Hydrothermal alteration by the geothermal waters, and the metal content of these waters, are among the features discussed.

There follow four chapters on the bedded non-metallic deposits, commencing with notes on the minor ones such as diatomite, dolomite, glauconite, oil shale, peat, phosphate and silica. A comprehensive treatment of deposits of coal, limestone and marble by Mr R. W. Willett, Director of the New Zealand Geological Survey, completes this section.

Chapter 19, compiled by Dr E. Lehner and the staff of D'Arcy Exploration, discusses oil and gas throughout the country, and the volume concludes with a chapter on clays by Drs M. Fieldes and G. G. C. Claridge of the Soil Bureau, Dr I. C. McDowall formerly of the N. Z. Pottery and Ceramic Manufacturers' Research Association, and G. J. Williams. The genesis of the various clays is discussed at length and there are sections on ceramic clays, bentonite, bauxite and vermiculite.

Thus the only economic deposits which are not discussed specifically appear to be building stone, road metal and concrete aggregate, and these are hardly serious omissions.¹ There are four references to building stone in the index, although one of these (p. 51) could not be located in the text. Conversely, dimension stone is mentioned in the text at least twice but it is not listed in either index. These are examples of minor difficulties which might be encountered in using the book.

¹ Editor's note: It is worth pointing out, however, that the present value of aggregate and road metal produced in N. Z. is nearly half that of all mining production (£9.75 m. out of £20.3 m. in 1963).

The volume as a whole represents a summary of an enormous amount of published and unpublished data, including some information from private company reports. However, it lacks chapter and section summaries although the numerous side headings and two indexes, which list mineral species localities, metals, rock names and general terms, provide adequate means for quick reference.

The volume is an essential text for the serious student, professional geologist and prospector in New Zealand. It will also receive wide acclaim overseas as well as at home because it brings together for the first time a wealth of previously inaccessible or unpublished data on a great variety of geological environments; it will be particularly useful for comparative studies in similar environments, notably Japan. Finally it provides an excellent starting point for any company interested in prospecting in New Zealand, and in this respect it may have been appropriate to include some notes on the country's mining laws.

- D. O. Zimmerman

FOR SALE - GEOLOGICAL INSTRUMENTS

Brunton Compass, Ainsworth

Brunton Compass, black enamel, with leather case

Parallel ruler, brass, 18 inch

Paulin (aneroid) altimeter

Prismatic Compass, card type, 4 inch diam.

Also geological and hydrological textbooks

Enquiries to Mr B. W. Collins, Information Service, D. S. I. R.
Box 8018, Wellington.

SYMPOSIUM ON VOLCANOLOGY, 1965

An International Symposium on Volcanology is being held in New Zealand from 22 November to 3 December of this year, commencing at Auckland, continuing at Rotorua and Wairakei, and concluding at Wellington. The pre-session and post-session tours are proving popular. Already it seems that the pre-session tour to Northland may be filled and an alternative tour to Coromandel may be necessary.

The tour guides for this meeting are being prepared as short papers on specific areas and will be published as a D. S. I. R. Information Series booklet. This is being compiled from numerous authors by Mr B. N. Thompson of Geological Survey, Auckland. The Chairman is Mr J. Healy and the Secretary is Mrs E. S. Rockell of the Rotorua office of Geological Survey.

The largest sub-committee is in Auckland, where the Symposium opens. Meetings there will be held at the University, and the Minister of Science will open the Symposium. In response to the Second Circular, sent out in early January, replies are rapidly pouring in. Many overseas scientists will be attending, including leading workers in volcanology from Japan, the United States, Italy and India.

Copies of the Second Circular were sent recently to all members of the Geological Society. The Secretary will be pleased to send circulars to scientists in New Zealand or overseas if any member would like to supply names and addresses of those likely to be interested. This should be done, however, as soon as possible. The Third Circular will be sent later, but only to those who have replied to the Second Circular.

- J. H.

N. Z. G. S. ANNUAL CONFERENCE, 1965

This will be held at Lower Hutt from 3 to 6 August. Two days of papers are planned and two of field trips. Among the papers will be several reviewing the history and progress of economic geology, palaeontology, petrology and volcanology over the past 100 years in New Zealand, while the Director will give a review of the progress of geological mapping.

The Tenth Annual General Meeting of the Society will be held during the Survey conference, probably on the evening of Wednesday, 4 August. A definite announcement will be circulated to members later.

OBITUARY

William Henry Victor Baker, 1887-1964

Bill Baker, who died in Palmerston North on 21 July 1964, at the age of 77, was a technical assistant to H. J. Finlay in the Geological Survey at 156 The Terrace in Wellington from 1938 to 1953. He was a bluff, cheery old naval man whose shrewd observations about things in general, and particularly of the people who made up our small geological world in those days, should have been recorded for posterity; it is I who am entirely to blame for this not having been done.

William Henry Victor Baker was born in Gravesend in 1887 where his father worked in the Thames docks. He was not a willing student, by his own admission, and cut short his schooling to take jobs with an undertaker and later with a chemist who still traded in leeches.

In his teens Bill ran away from home and took jobs on the Thames barges which traded around the coast in those days. As soon as he was old enough, he joined the Navy as a boy and eventually rose to the rank of stoker petty officer. At that time the Navy was coal burning and some ships were still square-rigged and carried sails to supplement their engines. Bill's stories of vain attempts to catch swift Arab dhows in the Red Sea by hauling up the propellor and clapping on all sail would have cracked the sides of the most obdurate listner.

During World War I Bill Baker was in the Red Sea patrol which sought and finally sunk the German raider Koenigsberg. He was later transferred to destroyers in the Diver Patrol which patrolled the English Channel and was on one of the ships that took part in the Zeebrugge raid.

For several years Bill Baker was in the Mediterranean Fleet, based on Malta and his stories of a British sailor's adventures ashore never failed to hold the rapt attention of envious listners condemned to live more circumscribed lives.

During the early 1920's Bill Baker came to New Zealand in H. M. S. "Chatham", which was based in Auckland as a training ship and he soon "bought out" of the Navy and married an Auckland girl, now Mrs F. C. E. Baker, living in Palmerston North.

Bill was a versatile man who could turn his hand to many things and he first ran a service car to Browns Bay, then helped to manage a farm in the Waikato, and after a desperate time in the Depression, a job at a gas works, and a spell running a fish shop, he was appointed as a technician to the late Dr H. J. Finlay in 1938.

Bill's incorrigible sense of humour, which had survived and even flourished under the twin yoke of naval discipline and tradition, and his unsinkable independence, made him an indestructible personality and he quickly established a mutual respect with H. J. Finlay, who was the most exacting of men to work with.

During the next 15 years as technician to the micropaleontology section, until he retired in 1953, Bill Baker developed his own methods of washing samples, and his neat copy-book writing in the registers records the many thousands he carefully and faithfully prepared. His versatility and dependability and pride in his job earned him a honourable place in the development of micropalaeontology in New Zealand.

There must be many who feel as I do, that his passing is a distinct personal loss.

- N. de B. Hornibrook

The deaths of Dr L. Bossard and Mr J. H. Williamson are also recorded with regret. Obituary notices will appear in the next issue of the Newsletter.

PERSONAL ITEMS

Members of the Society join in congratulating one of their Australian members, Prof. DOROTHY HILL, Geology Department, University of Queensland, on her recent election to Fellowship of the Royal Society.

New Zealand geologists attending the International Geological Congress at New Delhi in December 1964 were Prof. E. J. SEARLE, Dr J. B. WATERHOUSE, Dr H. W. WELLMAN and Mr R. W. WILLETT. Congratulations are extended to Mr Willett who was elected a regional vice-president of the International Union of Geological Sciences.

Dr H. W. WELLMAN, Victoria University of Wellington, is spending part of his sabbatical leave in Turkey.

Dr B. D. WEBBY, formerly with the N. Z. Geological Survey, is now a lecturer in geology at Sydney University.

Mr G. C. SHAW, N. Z. Geological Survey, Lower Hutt, recently returned from the United States where he spent a year teaching at the University of California at Santa Barbara and three months at the American Museum of Natural History, New York.

Mr D.R. GREGG, formerly in the Christchurch office of the N.Z. Geological Survey, is now Curator of Geology at the Canterbury Museum, Christchurch.

Dr B.H. MASON is now a curator of meteorites at the U.S. National Museum in Washington. He was formerly curator of mineralogy in the American Museum of Natural History, New York.

Dr R.C. MARTIN is at present with the California Department of Water Resources and is stationed at Bakersfield.

Mr P. BARRETT, formerly Geology Department, University of Auckland, is working for a Ph.D. at the Ohio State University, Columbus, Ohio.

Dr D. KEAR has transferred from the Papatoetoe office of the N.Z. Geological Survey to Lower Hutt, where he is in charge of the recently established Economic Section.

Dr A. WODZICKI recently returned to the N.Z. Geological Survey after completing a Ph.D. at Stanford University, California. He is to be working on geochemical problems, particularly trace element studies across igneous contacts.

Mr L. ANTONIO and Mr E. ESPIRITU from the Geological Survey, Philippines Bureau of Mines, are spending a year with the N.Z. Geological Survey at Lower Hutt on Colombo Plan grants. Mr Antonio is working with the Economic Section during his time in New Zealand, and Mr Espiritu with the Micropalaeontology Section.

Dr G. van der LINGEN recently arrived in New Zealand from Holland to join the N.Z. Geological Survey at Christchurch where he will be working with Dr J. T. Kingma. He graduated at the University of Utrecht and spent three years in Dutch Guiana before coming to New Zealand.

Mr L.E. OBORN has transferred from the Christchurch office of the Geological Survey to Lower Hutt where he is to look after engineering geology work on dam sites. He recently visited Australia for 2 months to examine engineering and ground water projects.

Dr K.R. GILL recently arrived from England to join the N.Z. Geological Survey after completing a Ph.D. at the Department of Mineralogy and Petrology, Cambridge University, on rocks from Shetland. He will be attached to the Petrology Section at Lower Hutt.

Dr I.G. SPEDEN recently returned to the Geological Survey, Lower Hutt, after completing a Ph.D. in palaeontology at Yale University. On his way back to New Zealand he visited Japan for several weeks to examine areas of special geological interest.

Mr R. BRYANT returned in March 1965 to Sarawak after spending two years in technical training, on a Colombo Plan grant, with the Petrology Section of the Geological Survey in Lower Hutt.

Mr V.R. MCGREGOR is at present studying for a Ph.D. at the Mineralogisk - Geologiske Institut, University of Copenhagen.

Mr R. COOPER recently returned to New Zealand after spending 18 months in Sabah doing geochemical prospecting for copper and nickel with the United Nations Labuk Valley project. He is now with the Dunedin office of the N. Z. Geological Survey.

Mr J.W. BRODIE, N. Z. Oceanographic Institute, Wellington, recently visited Hawaii to attend a UNESCO meeting on the Tsunami Warning System.

Dr D. ZIMMERMAN, formerly lecturer in geology at the University of Auckland, has recently joined the I. M. C. Development Corporation, Melbourne.

Mr P. RILEY, a graduate of the School of Mines, University of Otago, has joined Lime & Marble Ltd as assistant mining geologist. In recent years he has been working in the tin-mining area of Pahang, Malaysia.

Geochemical Group

The formation of a Geochemical Group is proposed and will be discussed during the N. Z. Institute of Chemistry Conference in Dunedin, August 17 - 20, 1965. The group will be independent of the Institute of Chemistry, and its principal activity is envisaged as an annual scientific meeting, initially in association with other conferences.

Further information may be obtained from Mr S. H. Wilson, C/- Institute of Nuclear Sciences, Private Bag, Lower Hutt.

NEW MEMBERS

The following persons have joined the Society since the publication of the last issue of the Newsletter:

Dr O. C. Farquhar, Geology Department, University of Massachusetts,
AMHERST, Mass., U. S. A.

Dr M. J. Frost, Geology Department, University of Canterbury,
CHRISTCHURCH.

Dr E. D. Ghent, Geology Department, Victoria University of Wellington,
WELLINGTON.

Mr H. W. Hamilton, "Ribbonwood", The Downs, GERALDINE.

Mr H. Hattori, House No. 117-201, Tamadaira, 1700 Toyoda, Hino-shi,
TOKYO, Japan.

Mr J. A. Mason, P. O. Box 14, CHRISTCHURCH.

Mr G. Neef, Grandview House, MANAPOURI.

Mr L. Newnham, Te Puna, TAURANGA.

Mr R. Proctor, 81 Copeland Street, LOWER HUTT.

Mr P. G. Wood, 98 Palmerston Street, WESTPORT.

Postscript: Recent publishing news. N. Z. G. S. Bull. 66, and the accompanying 1:2,000,000 maps, have been completely translated into Russian and published in Moscow.
